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Implications of WHO COVID-19 interim guideline 2020.5 on the comprehensive care for infected persons in Africa Before, during and after clinical management of cases

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ABSTRACT

The novel coronavirus disease 2019 (COVID-19) is one of the biggest public health crises globally. Although Africa did not display the worst-case scenario compared to other continents, fears were still at its peak since Africa was already suffering from a heavy load of other life-threatening infectious diseases such as HIV/AIDS and malaria. Other factors that were anticipated to complicate Africa's outcomes include the lack of resources for di-

Abbreviation: AFCOR, Africa Task Force for Novel Coronavirus; AIDS, acquired immune deficiency syndrome; ARDS, acute respiratory distress syndrome; CO₂, carbon dioxide; ECMO, extracorporeal membrane oxygenation; GGHE, general government health expenditure; GGE, general government expenditure; H₂O, Hydrogen; HIV, Human immunodeficiency virus; MERS, Middle East Respiratory Syndrome; NHS, national health services; O₂, Oxygen; PCR, polymerase chain reaction; PTSD, post-traumatic stress disorder; RECOVERY, Randomized Evaluation of COVID-19 Therapy; SARS, severe acute respiratory syndrome; US-CDC, United States Centre for Disease Control; WHO, World Health Organization.

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agnosis and contact tracing along with the low capacity of specialized management facilities per capita. The current review aims at assessing and generating discussions on the realities, and pros and cons of the WHO COVID-19 interim guidance 2020.5 considering the known peculiarities of the African continent. A comprehensive evaluation was done for COVID-19-related data published across PubMed and Google Scholar (date of the last search: August 17, 2020) with emphasis on clinical management and psychosocial aspects. Predefined filters were then applied in data screening as detailed in the methods. Specifically, we interrogated the WHO 2020.5 guideline viz-a-viz health priority and health financing in Africa, COVID-19 case contact tracing and risk assessment, clinical management of COVID-19 cases as well as strategies for tackling stigmatization and psychosocial challenges encountered by COVID-19 survivors. The outcomes of this work provide links between these vital sub-themes which may impact the containment and management of COVID-19 cases in Africa in the long-term. The chief recommendation of the current study is the necessity of prudent filtration of the global findings along with regional modelling of the global care guidelines for acting properly in response to this health threat on the regional level without exposing our populations to further unnecessary adversities.

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Introduction

Until the outbreak of the novel coronavirus disease 2019 (COVID-19), Africa bore the highest-burden of most infectious diseases such as smallpox, Human immunodeficiency virus/ acquired immune deficiency syndrome (HIV/AIDS), tuberculosis, malaria, and Ebola virus [65]. The COVID-19 pandemic was first detected in the city of Wuhan, Hubei Province in China in December 2019. The virus has spread rapidly since then across most countries with the highest-burden in Europe and America. Although the virus has continued to wreak havoc in different countries at an alarming pace [6], the burden is lowest in Africa. As of October 14th, 2020, Africa shared only 4.2% of the global 38,404,464 COVID-19 cases and 3.5% of global COVID-19 1,091,569 casualties [97].

The low COVID-19 burden in Africa may not be disconnected with differences in environmental conditions such as temperature and humidity and the fact that Africa had a reasonable window of opportunity to prepare for the pandemic. In Africa, the first case was reported in Egypt on February 12th 2020 [97]. The over one-month gap between the first outbreak in most countries and the first outbreak in Africa could have allowed different governments in Africa to make individual public and clinical health strategies to contain the spread of the virus. Collectively, the African Union organized an emergency meeting of African health ministers on the pandemic in late February. The establishment of the Africa Task Force for Novel Coronavirus (AFCOR) to oversee preparedness and response to the pandemic, through a partnership with governments and key stakeholders, was the offset of the ministers' meeting. The task force was mandated to deliver policies and action plans on "laboratory diagnosis and subtyping; surveillance, including a screening at points of entry and cross-border activities; infection prevention and control in healthcare facilities; clinical management of severe COVID-19; risk communication; and supply chain management and stockpiles" [65]. Rosenthal et al. [65] noted that with the cooperation of the African regional WHO Bureau, African Centre for Disease Control and other stakeholders, AFCOR has made substantial progress. Besides, African governments received support in terms of funds and supplies from citizens and the WHO [6]. Nonetheless, by April 2020, most countries in Africa had reported at least one case of COVID-19, with thousands of cases reported in South Africa, Nigeria and Ghana [97]. Concerns have been raised that there could be several thousands of unidentified and asymptomatic COVID-19 cases across the continent [50,24].

These efforts and low burden of COVID-19 in Africa notwithstanding, there are needs for reinforced and enhanced preparedness, surveillance, clinical management, discharge of cases, public enlightenment on tackling stigmatization and psychosocial challenges faced by discharged cases. While clinical management of COVID-19 cases presents a daunting task in Africa, risk assessment, contact tracing, psychological impact, mental health challenges, and stigmatization of COVID-19 patients present another set of hurdles to be overcome [6,12,56,53]. The recently released WHO interim guideline with reference number WHO/2019-nCoV/clinical/2020.5 on the clinical management of COVID-19 is wider than the earlier guidelines and has brought other critical COVID-19 issues besides clinical management of cases to the fore [82]. The old guidelines were primarily intended for clinicians caring for COVID-19 cases during all phases: from screening to discharge. The new guideline included provisions on a multi-disciplinary approach to care for patients with mild, moderate, severe, and critical COVID-19 disease. It included sections on care pathway, neurological and mental manifestations, non-communicable diseases, rehabilitation, palliative care, ethical principles amongst others [82].

In addition to other existing specific issues, the guidance document recommended the discontinuation of transmission-based precautions (including isolation) and release of symptomatic patients from the COVID-19 care pathway by 10 days

after symptom onset plus at least 3 days without symptoms (without fever and respiratory symptoms) [82]. These have raised several questions and concerns about the impact of the guideline on Africa and its healthcare systems. The WHO guideline may prove useful in limited-resource settings, with issues such as shortage of health practitioners, shortage of hospital wards and other personal protective equipment (PPE). However, there could be attendant consequences in the containment of the virus. For an effective, efficient and comprehensive management of COVID-19 cases in Africa, there are needs for critical steps and wholesome approach starting with strong political will from the government, health prioritization with special focus on COVID-19, adequate financing, risk assessment and contact tracing policies and strategies to (i) reduce the rate of transmission and (ii) prepare for the management of cases [13,42,82]. These strategies must, therefore, be in place before an individual contracts the virus. While admitted to the hospital or any other designated place, there is a need for efficient clinical management of COVID-19 cases as well as prevention and management of stigmatization and psychological-related issues during treatment in the hospital and after discharge [6,12,32,50,53,56].

The current review is set to assess and generate discussion on the realities, obstacles and advantages of the latest WHO guideline on the clinical management of COVID-19. Specifically, we interrogated the guideline viz-a-viz health priority and health financing in Africa, COVID-19 case contact tracing and risk assessment, clinical management of mild, moderate, severe, and critical COVID-19 cases as well as stigmatization and psychosocial impact, challenges and its management in the society at large. We correlated and provided links between these sub-themes as they all constitute vital issues that may impact the containment and management of COVID-19 cases in Africa in the long term.

Methodology

We performed a non-systematic review of literature for this study. The search for papers was done on PubMed and Google Scholar between July 1 and August 17, 2020. The search terms included different combinations of the following keywords: “COVID-19”, “hospital discharge”, “psychology”, “psychosocial”, “psychological impact”, “social stigma”, “mental health”, “risk assessment”, “contact tracing”, “WHO interim guidance” “WHO discharge protocol” and “Africa”, with an emphasis on clinical management and psychosocial aspects. To ensure that we obtained a comprehensive list of studies, we also went through the citations and the reference lists of the selected papers. After every search, articles were screened and included in the review database based on pre-defined criteria: (i) published in English, (ii) peer-reviewed and pre-prints, with full text available, (iii) COVID-19 information included health priority and health financing in Africa, case contact tracing and risk assessment, clinical management and stigmatization and psychosocial challenges, and (iv) data were not already included in a previous paper to avoid duplication. Elimination of irrelevant papers was done a case-by-case basis. These procedures yielded relevant literature for this study and in total ninety-nine (99) peer-reviewed scientific publications, including pre-prints, were accessed and included in this review, out of an initial 1832 papers. The search for articles was performed independently by five authors (AFF, MFT, EFA, PKM, ND) who applied the eligibility criteria to select relevant articles. Disputes regarding the selection of articles were resolved by discussion with all other authors. We did not include conference contributions or peer-reviewed magazine articles. Authors made every effort to provide a comprehensive evaluation of the published evidence and to accommodate the rapid turnover of information related to the COVID-19 pandemic. No quantitative data extraction was carried out.

Health priorities in Africa

African health systems have been generally described as weak [2]. The weakness has been ascribed to underfunding and under-resourcing which is further worsened by the cumulative burden of infectious and chronic diseases [2]. The key challenges facing healthcare services in Africa are mainly inadequate human resources, inadequate health budgetary allocation and poor leadership and management [55,28,59]. Gouda et al. and Dalal et al. have also identified inaccurate, inconsistent, irregular and unreliable vital statistical systems and reliable population-level data for most countries in sub-Saharan Africa as major barriers to health system strengthening in Africa [30,20].

Over the last decade, African countries and their development partners have primarily focused on HIV/AIDS and malaria, as the region represents 60% of the people with HIV/AIDS, and over 90% of the estimated 300–500 million annual malaria worldwide. This is in addition to neglected tropical diseases [83] for which the continent accounts for nearly 50% of the global burden. Other areas of focus are the elimination of preventable childhood illness, polio and measles containment through efficient treatment and vaccination [94]. These statistics indicate what the health priority of Africa is in recent decades. The outcome of a 2013 Pew Research centre survey in six African nations on people's perception of the major priority in African nations further corroborates the statistics. The population-based survey showed that improving hospitals and dealing with HIV/AIDS topped the list followed by public health issues (Table 1).

Besides the reports from the Pew Research centre survey, the WHO State of Health in Africa report provides a comprehensive overview of the state of health in the region, the related services people need, and the performance of their health systems [91]. The WHO recognized the trio of respiratory infections, HIV, and diarrhoeal disease as the top killers in Africa with countries battling them through specialized programmes. However, to ensure a Universal Health Coverage (UHC), all conditions affecting a population, must be improved. Africa's health system has not given due attention to the adolescents and the elderly which has led to high fatalities amongst people with non-communicable diseases (NCDs) [91].

Table 1
Distribution of health priorities in some African countries.

Country	Building and improving hospitals (%)	Preventing and treating HIV/AIDS	Access to drinking water	Access to prenatal care	Fight hunger	Prevent and treat infectious diseases	Increased child immunization
	% should be one of the most important priorities for the government						
Ghana	85	81	88	81	81	79	72
Senegal	84	79	80	84	86	80	74
Uganda	78	77	72	73	65	70	66
Kenya	74	63	72	67	70	62	58
S. Africa	66	75	67	64	67	63	63
Nigeria	64	59	62	64	60	60	56
Median	76	76	72	70	69	67	65

Source: Pew Research centre survey [58].

Table 2
Trends in total health expenditure per capita in current US\$.

Year	Less than US\$ 20	US\$ 20–US\$ 44	More than US\$ 44
2001	Benin, Burkina Faso, Burundi, Central Africa Republic, Chad, Comoros, DRC, Eritrea, Ethiopia, Gambia, Ghana, Guinea Bissau, Kenya, Liberia, Madagascar, Malawi, Mali, Mozambique, Niger, Nigeria, Rwanda, Togo, Uganda, Tanzania (24 countries)	Angola, Cameroon, Congo, Côte d'Ivoire, Guinea, Lesotho, Mauritania, Senegal, Sierra Leone, Zambia (10 countries)	Algeria, Botswana, Cape Verde, Equatorial Guinea, Gabon, Mauritius, Namibia, Sao Tome and Principe, Seychelles, South Africa, Swaziland (11 countries)
2005	Burundi, Central African Republic, DRC, Eritrea, Ethiopia, Gambia, Guinea, Liberia, Madagascar, Malawi, Mozambique, Niger, Rwanda, Tanzania (14 countries)	Angola, Benin, Burkina Faso, Chad, Comoros, Congo, Côte d'Ivoire, Ghana, Guinea-Bissau, Kenya, Lesotho, Mali, Mauritania, Senegal, Sierra Leone, Togo, Uganda, Zambia (18 countries)	Algeria, Botswana, Cameroon, Cape Verde, Equatorial Guinea, Gabon, Mauritius, Namibia, Nigeria, Sao Tome and Principe, Seychelles, South Africa, Swaziland (13 countries)
2010	Central African Republic, DRC, Eritrea, Ethiopia, Madagascar, Niger (6 countries)	Benin, Burkina Faso, Burundi, Chad, Comoros, Gambia, Guinea, Kenya, Liberia, Malawi, Mali, Mauritania, Mozambique, Sierra Leone, Togo, Tanzania (16 countries)	Algeria, Angola, Botswana, Cameroon, Cape Verde, Congo, Côte d'Ivoire, Equatorial Guinea, Gabon, Ghana, Guinea-Bissau, Lesotho, Mauritius, Namibia, Nigeria, Rwanda, Sao Tome and Principe, Senegal, Seychelles, South Africa, Swaziland, Uganda, Zambia (23 countries)

Source: WHO [95].

The WHO report showed that Africa's health systems are only performing at 49% of their potential capacity and have generally low ability to improve access to services, quality of care, community demand for services and resilience to outbreaks [91]. Countries in the continent were found to have exceptionally low performance in ensuring access to services and resilience to outbreaks. The report concluded by calling for “more acute investment in the health workforce, and having health facilities close to patients” [91].

Another critical contributor to deficient health care systems in Africa is the little attention paid to the critical interface between education and good health. Azevedo [5] emphasized how the education of women and mothers plays a crucial role in preventing child diseases and ensuring the wellbeing of the entire family [5]. The author also pointed out that many medical educational institutions in Africa have misplaced priorities as they often “tend to perpetuate, at times, skewed and irrelevant Eurocentric health training, the national pyramidal health structure, weakened at the village level, and disproportionately favoring the provincial and national hospitals” which had hitherto underserved the rural areas [5].

Health expenditure in Africa

There is no doubt that contact tracing and risk assessment are not possible in the absence of adequate financing and political goodwill. The shortage of skilled health practitioners and health supplies could be a function of priority and importance accorded to health and efficiency of health policy in Africa. This section reviewed the health priority of Africa and proficiency in Africa's health policy.

Literature is consistent that there is a need to put in place adequate financing mechanisms to tackle health situations and improve healthcare delivery. Health expenditure is a key indicator of health prioritization in Africa. As shown in Table 2, there has been a considerable increase in health expenditure in Africa. For example, in 2001 24 countries spent less than \$20 per capita while 11 countries spent over \$44 per capita. However, in 2010 only 6 countries spent less than \$20 per capita with as many as 23 countries spending over \$44 per capita. Although the trend shows an increment in health spending, the level of health expenditure in Africa is lower than most parts of the world.

Table 3

Total health expenditure against general government health expenditure and general government expenditure (GGHE/GGE).

Expenditure per capita	GGHE/GGE more than 15%	GGHE/GGE less than 15%
Total health expenditure per capita more than US\$ 44	Botswana, Rwanda, Zambia (3 countries)	Algeria, Angola, Cameroon, Cape Verde, Congo, Côte d'Ivoire, Equatorial Guinea, Gabon, Ghana, Guinea-Bissau, Lesotho, Mauritius, Namibia, Nigeria, Sao Tome and Principe, Senegal, Seychelles, South Africa, Swaziland, Uganda (20 countries)
Total health expenditure per capita less than US\$ 44	Madagascar, Togo (2 countries)	Benin, Burkina Faso, Burundi, Central African Republic, Chad, Comoros, DRC, Eritrea, Ethiopia, Gambia, Guinea, Kenya, Liberia, Malawi, Mali, Mauritania, Mozambique, Niger, Sierra Leone, Tanzania (20 countries)

Source: WHO [95].

Most African countries are responding to the Abuja declaration which stipulates that 15% of the government budget should be allocated to the health sector and the recommendation to allocate at least US\$ 44 per capita to deliver an essential package of health services. Nonetheless, less than two-thirds of the countries in the African region has not managed to raise health spending to the level of US\$ 44 (Table 3). WHO recommends strong synergy and collaboration between the ministries of health and finance to foster a good understanding of the health financing process for the increase in budgetary allocation to be meaningful.

In a more recent assessment, WHO [91] reported that health budgeting and actual spending are generally low. On the average, only two-fifths of health budgets are spent on medical products, health workforce (14%) and infrastructure (7%). For Africa to have better health outcomes, countries must invest up to 40% of health budgets on the health workforce and 33% on infrastructure. This has resulted in a physician/people ratio of 1:5000 in Africa while hospital-beds/people is 1:650 [91].

The report also noted that certain countries have distinct health focus which had hitherto pushed their health performances above average. For instance countries such as Algeria excelled in having good coverage of available health services; Cabo Verde (good community demand for essential services, and resilience of health systems); Kenya (good range of available essential services); Mauritius (good access to services); Namibia (good financial risk protection); Seychelles (good coverage of health related services) and South Africa (good health security). Other countries should learn from these countries on the different UHC dimensions and other SDG health targets [91].

There are needs for health policymakers in Africa to reorient health policies to address the current challenges of containing COVID-19. This new paradigm should focus on capacity building and increment in health practitioners, adopting new technologies in all health system processes from digital health to mobile health especially for record-keeping, procurement, resource mobilization and resource sharing, diagnoses, treatment and drug distribution. Besides, there is the need to review existing health policies to suit current situations and trends, expand infrastructures and capacities to increase access to health and healthcare and improve access to health technologies, including diagnostics [94]. This review brings to the fore the need to put in place a formidable plan to finance evolving health challenges facing Africa, including COVID-19. To control and manage COVID-19 in Africa, all activities involved in the WHO guidance should be adequately financed. These activities include risk assessment, contact tracing, clinical management, and addressing stigmatisation and psychological impact which shall be discussed in the subsequent sections.

Risk assessment and communication

Risk assessment employs a systematic process whereby information is gathered, assessed and documented so that a level of risk can be assigned. This allows for the course of action that can be taken in managing and reducing the antagonistic consequences of risks in public health. Risk assessment includes three components such as hazard, exposure and context assessment. Hazard can be determined by the clinical features and history of the disease; timeframe and speed with which the occurrence evolves; the affected settings and geographical area; and the affected individuals or populations. Exposure identifies individuals or populations exposed to the hazard; and susceptibility. Context assessment includes scientific, social, economic, technical, environmental, policy, ethical and political factors that impact the risk [96].

According to the WHO interim guidance [82], specific guidance can be utilized by countries for risk assessment regarding healthcare workers exposure risk assessment, mass gatherings that include generic, sporting and religious events. Due to the nature and risk of work entailed for healthcare workers, the interim guidance covers community exposure, interactions with COVID-19 patients in healthcare facilities and infection prevention and control (IPC) recommendations [84]. Individual and/or population level risk assessment void of the aforementioned settings is absent. Therefore, as the COVID-19 outbreak continues, all countries need to adopt a site-specific approach for risk assessment as exposure and transmission risks are not the same across populations. There needs to be local buy-in as well as local data that provides local ownership of the data that the government collects on their databases. A settings context must be applied, whereby the understanding of complex relationships, gender norms, community's socio-cultural diversity and geographical characteristics such as urban informal

and slum areas is essential. Another key factor worth noting is access to services such as water, sanitation and hygiene, food and other essentials, to ensure that the impact of resources coming into settings during crises does not exacerbate tensions and inequalities. Each setting requires an emergency plan on the risk assessment that is derived from the country national COVID-19 plan. There should be a balance of the potential benefits of having strict control measures, coupled with protection and socio-economic consequences. This is essential in the African setting where populations and individuals are plagued by socio-economic issues, poverty and non-access to basic necessities such as water, sanitation and hygiene. Risk communication to populations must be effective and devoid of fear, discrimination, suspicion, misinformation or stigmatization. Rather, risk communication must entail the creation of empowering, behaviour-changing, empathic and trustworthy messages that are delivered in local languages, through appropriate and transparent communication channels, and that are inclusive of populations that may be illiterate, who do not have access to digital platforms, those with disabilities or cannot access the usual communication channels [37].

Various social media groups and apps have been introduced during the COVID-19 outbreak. The WHO, in March 2020, set up a WhatsApp group that provides both information and instructions for risk mitigation [15]. Various countries have also launched communication structures that include information platforms and websites, news, tackling misinformation and fake news as part of national communication measures. Mobile apps have become an important part of risk communication strategies by providing risk communication. While these risk assessment tools have been effective, they have been used only for tracking infected patients and diagnosis through symptoms, alerting communities and governments to knowing if they are in the vicinity of infected persons [15]. While risk communication must become powerful tools to reach all populations, we must be aware of the social media infodemic that can create fear, suspicion and disbelief due to misinformation and conspiracy theories [18].

Contact tracing

Contact tracing is a pivotal tool in public health implemented for the control of infectious disease outbreaks. Systematic application of contact tracing can result in a break in transmission chains of infectious diseases such as COVID-19, whereby the process identifies individuals who may have been exposed to COVID-19 and the daily follow up process for 14 days from the last exposure point. Effective contact tracing requires countries to have ample testing capacity of suspected cases promptly. Where this method is not possible, the strategies for contact tracing may then focus on the high-risk settings that include closed settings such as care facilities and hospitals [42]. The WHO guidelines on contact tracing also indicate that COVID-19 transmission may occur during the asymptomatic or pre-symptomatic phases and so the quarantining of individuals to reduce potential secondary transmission is emphasized. The guidance further defines contact as someone exposed to a case of COVID-19, possibly from 2 days and up to 14 days after the onset of infection, (a) with exposure possibly due to having a contact of one metre within a distance of a COVID-19 case for 15 min or longer; (b) having direct contact (physical) with a COVID-19 case, and (c) the direct provision of care to COVID-19 patients without proper personal protective equipment (PPE) being used. Asymptomatic cases are advised to be managed in the same manner as symptomatic cases. The guidance also makes provision for contact tracing in settings at the household, community levels; closed settings; healthcare settings; shared or public transport; workplace, schools, places of worship and social events [85].

Effective and rapid contact tracing is highly efficacious during early COVID-19 control, but this may place considerable pressure on local public health officials. In many countries, human resources for contact tracing are limited, and thus the likelihood of tracing potentially infected individuals when the infection peaks are accelerating is difficult. Some countries in the Asian continent have taken the route of proactively opening data relating to confirmed cases to medical institutions and/or the general public so that close contacts are managed more effectively [41]. In Singapore, patient details such as workplace, residence and places visited are disclosed by the government [51]. In Taiwan, the airport immigration database in combination with the national medical database is accessed to determine visitation to other countries by patients [79]. Patient details such as gender, age, geographical location and nationality are amongst others shared by some governments [46]. In South Korea, contact trace data of patients are disclosed to prevent further COVID-19 spread. Local governments pseudonymised patient data such as travel logs, demographics and information of infection before it is released to the general public. The released information assists the public to do self-checks to identify if there was co-location with confirmed patients [100]. While the identification of potential contacts may be favourable to ensure public safety, the revealing of public data results in patient privacy infringement. This could lead to privacy risks such as rumour-mongering and online abuse. Therefore, while these countries may have implemented identifiable ways in contact tracing, there need to be more efforts in minimizing disclosure of privacy infringement and related social stigma [21,57]. The WHO guidelines identify that the ethics of data protection and privacy, and public health information must always be considered at the various contact tracing stages, in every training activity and during tool implementation [82]. Put differently, whilst this situation poses an ethical dilemma, it calls for well-coordinated initiatives, collaborative efforts and proactive measures that embrace the protection of human rights as an integral part of our public health response to the COVID-19 pandemic [86]. Significantly, this will not only provide ethical guidance about finding a good balance between accurate information sharing and privacy concerns (e.g., social stigma and psychological impact) during this pandemic but set the agenda for how individuals, communities and governments respond to future public health crises.

Clinical management and pharmacotherapy

Clinical management of mild COVID-19 cases

The WHO recommendation for suspected or confirmed cases of mild COVID-19 is for individuals to be isolated to contain the virus and prevent further transmission. Isolation may be done at a designated COVID-19 health facility or the individual's home (self-isolation) [87].

Patients without viral pneumonia and hypoxia may not require hospitalization as they are considered to have a mild case. These patients may be able to manage their condition at home. This may differ from case to case. Important factors for frontline management to consider include supportive care requirements, the potential risk for developing severe disease, and suitability of home self-isolation. Close monitoring of patients with risk factors for severe disease is recommended especially in the second week after initial symptom onset. Symptoms such as difficulty breathing (for infants: grunting), blue lips or face, chest pain or pressure, inability to awaken, new confusion or inability to drink or keep down liquids indicate deterioration of the condition [79,32,36]. Symptomatic treatment is recommended for patients with mild COVID-19 by the WHO. Patients should receive adequate nutrition and rehydration; antipyretics may be given for fever and pain [22]. Prophylactic antibiotic therapy is unnecessary for a patient with mild COVID-19. Data on the use of antiviral or immune-based therapy are insufficient for a recommendation to be made in patients with mild COVID-19 illness [79,32,36].

Clinical management of moderate COVID-19 cases

COVID-19 illness is defined as moderate when there is evidence of lower respiratory disease after clinical assessment or imaging with $\text{SpO}_2 \geq 94\%$ on room air. Patients presenting with the moderate disease may present to a health facility, or encountered through home visits or by telemedicine. Isolation is crucial for patients with moderate COVID-19 to contain the virus. Moderate COVID-19 cases typically present with pneumonia-like symptoms. For patients with high-risk factors for severe disease, isolation in hospitals is favoured. Antibiotic treatment is only required where there is either suspicion or confirmation of bacterial infection.

Clinical management of severe and critical COVID-19 cases

Severe cases of COVID-19 encompass patients presenting with symptoms of severe pneumonia or $\text{SpO}_2 < 90\%$ even without demonstrating emergency signs. The WHO interim guidance 2020.5 indicates the immediate administration of supplemental O_2 therapy. Patients with emergency signs such as severe respiratory distress, absent or obstructed breathing, coma or shock or seizures should receive both airway emergency management in addition to O_2 therapy with an oxygen pressure target of $\text{SpO}_2 \geq 94\%$ [93,92].

Patients with acute respiratory distress syndrome (ARDS) are classified as critical cases. The hypoxemic respiratory dysfunction associated with ARDS usually stems from intrapulmonary ventilation-perfusion mismatch or shunt that often requires mechanical ventilation using lower tidal volumes (4–8 mL/kg predicted body weight) and lower inspiratory pressure (plateau pressure < 30 cm hydrogen (H_2O)) [69]. The WHO guidance recommends a titration for higher positive end-expiratory pressure for patients with moderate or severe ARDS and keeping in mind potential associated risks including lung injury of increased vascular resistance [73]. Only patients with refractory hypoxaemia despite lung-protective ventilation are recommended to be referred for extracorporeal membrane oxygenation (ECMO) [19].

ECMO is a form of modified cardiopulmonary bypass in which venous blood is and pumped through an artificial membrane lung where carbon dioxide (CO_2) is removed and oxygen (O_2) is added, then the blood is returned to the patient, either via another vein to provide respiratory support or a major artery to provide circulatory support [11]. So, this technique keeps the patient oxygenated and viable without putting pressure on the already exhausted and blocked lungs associated with COVID-19. The use of ECMO was linked to reduced incidence of pulmonary morbidities induced by high-pressure ventilation with a subsequent decrease in mortality rates [29,48]. Despite that ECMO cannot be applied to a wide range of patients, especially because it is an expensive form of life support that requires a highly specialized team. Moreover, we should still take into consideration that ECMO-associated complications like haemorrhage or nosocomial infections can be lethal.

Corticosteroids such as dexamethasone have been debated as a potential addition to the treatment of severe COVID-19 patients with hypoxaemia. The Randomized Evaluation of COVID-19 Therapy (RECOVERY) trial showed that the administration of low dose dexamethasone (6 mg/day) for up to 10 days enhanced the 28-day survival and reduced mortality rates (8–26%) compared to the standard care in patients who were receiving respiratory support [31]. The dose recommended by this trial is about half the regular corticosteroid dose used for similar non-viral respiratory indications. The National health services (NHS) COVID-19 protocols were changed to include dexamethasone for similar cases based on the findings of RECOVERY trial. Conversely, the United States Centre for Disease Control (USA-CDC) as well as the World Health Organization (WHO) are against the use of dexamethasone in COVID-19 management with the fear of increased duration of viral replication. While viral load data were not reported in the RECOVERY study, future studies should take that into consideration.

We need to exercise great caution before thinking about the extrapolation of the recommendations of RECOVERY study by adding dexamethasone to COVID-19 treatment protocols in other parts of the world like Africa needs great caution. Since

previous experiences with extending the implementation of corticosteroids in Africa based on data from high-income countries were not fortunate and posed a hazard on African patients. For example, the use of antenatal corticosteroids as standard therapy for threatened preterm labour increased mortality in neonates and augmented the risk of maternal infections [3]. Additionally, the risk of nosocomial infections is higher in low and middle-income countries [49]. This might also add another layer of complication to the decision of considering dexamethasone in the management of COVID-19 pneumonia without strong basis from findings generated from African clinical trials. Nevertheless, the management of COVID-19 is not only confined to relieving respiratory complications. It extends further to cover other aspects that have a sensible impact on the quality of life of COVID-19 survivors including social stigmatization and psychological consequences.

Social stigma and psychological impact

Calamities can have a remarkable impact on the psychological wellbeing of people, affecting their quality of life over an extended period even after the calamity has ended [23]. Previous disease epidemics including HIV, Severe Acute Respiratory Syndrome (SARS) and Ebola have been associated with fear and stigmatization amongst those infected for years after exposure making it difficult for patients to return to a normal pattern of life [57,44,70,8], as well as verified several psychological issues such as anxiety, depression, panic disorder, delirium, suicidal thoughts and psychosis [99]. Now in 2020 as we face the COVID-19 pandemic, there has been concern and reports of psychological distress depression, anxiety, mental illness, and stigmatizing factors including patient ostracization, racism, marginalization due to the economic and social aftermath, and discrimination [26,47]. It is in light of this context that we provide a review of the psychological and stigmatization implications of the WHO updated recommendations on the criteria for discharging COVID-19 patients from isolation. Within the context of the WHO 2020.5 guidelines, the issue of stigma and psychological impact is already manifesting given the uncertainty and mixed reactions to the guidelines which is largely attributed to the lapses in our response to the COVID-19 pandemic (i.e., risk assessment, contact tracing, isolation, and the before, during and after clinical management of cases) combined with the persistent challenges facing health systems in Africa [86]. Personal risk factors amplified by the COVID-19 pandemic including time spent in quarantine, social isolation, having children at home, comorbid physical health conditions and the impact of the pandemic on personal lifestyle and social activities have the tendency to exacerbate stigma and psychological issues. Stigmatization and discrimination are known to negatively influence health behaviours, which tend to have a range of psychological, and physical and mental health consequences for stigmatized groups and communities [14].

Psychological impact

During the acute stage of SARS and Middle East Respiratory Syndrome (MERS), reports indicated that psychological impact of quarantine and discharge can vary from immediate effects, like irritability, fear of contracting and spreading the infection to family members, anger, loneliness, denial, anxiety, depression, insomnia, confusion, with delirium suggested as common in and out of hospital, to extremes of consequences, including suicide [17,68,40,12]. After infection recovery, fatigue, emotional lability, sleep disorder, impaired memory and concentration, and frequent traumatic event recollection were frequently reported during patient follow-up starting at 6 weeks up to 39 months [68].

With the increasing number of infected cases and deaths, the current WHO COVID-19 discharge guidelines have manifold consequences on mental health and well-being [26]. Empirical studies suggest that people affected by COVID-19 already have a high burden of mental health problems, including depression, anxiety disorders, stress, panic attack, irrational anger, impulsivity, sleep disorders, emotional disturbance, posttraumatic stress symptoms, and suicidal behaviour [64].

De-isolated or discharged patients can thus experience loneliness, anxiety, and distress due to uncertainty about their health status and develop obsessive-compulsive symptoms, such as repeated temperature checks and sterilization, as well as anger, fear, depression, insomnia and symptoms of post-traumatic stress that could negatively affect the social and occupational functioning of individuals and the quality of life [45,10]. There can be psychological distress consequent to the discharge, feelings of guilt and worries about family and others as well as anxieties about recovering and integrating into the society. For families receiving the discharged patients, the integration can be unbearably painful from a psychological viewpoint leading to uncertainty, helplessness and depression [74].

It was therefore suggested that patients on discharge, especially those with family stressors and severe illness [47], directly receive mental health resources. Further investigation also identified the link between discrimination and social stigma that can exacerbate the psychological impact of COVID-19 [47]. This is consistent with a past SARS study which indicated that recovered patients are avoided after discharge due to fear of being infected [57]. Therefore, discrimination fears associated with COVID-19 patients, together with feelings of isolation or being labelled as “othered” can contribute to mental health symptoms [47]. We must also be cognizant of patients with mild to moderate disease remaining asymptomatic. Viral transmission generally was indicated to start 2,3 days before first symptoms, peaking 0.7 days prior to the onset of symptoms, and symptoms lasting at approximately 21 days. Hence, this is indicative of asymptomatic patients as the prime drivers for the COVID-19 pandemic magnification [34,35,1]. These patients have a greater chance of transmitting the virus unknowingly, providing an unfortunate opportunity for discrimination and social stigma.

The WHO clinical management of COVID-19 interim guidance indicates that in post-discharge there needs to be multidisciplinary rehabilitation whereby psychosocial and mental health practitioners and other healthcare professionals with the appropriate skillsets are included and based on country specific contexts and settings rehabilitation programmes must

include stress management. Mental health and psychosocial support must continue beyond patient discharge to ensure that symptoms do not progress and worsen. This can be provided using telehealth [88].

Social stigma

The WHO COVID-19 updated discharge guidelines may also give rise to stigmatizing factors like fear of de-isolation, fear of association, discrimination, and marginalization with all its social and economic implications [70]. Cases of stigmatization and marginalization against patients in isolation undergoing treatment and those who have been discharged from isolation are also being widely reported [26,57]. Discharged patients are at higher risk of living with the fear of transmitting the disease as well as experiencing adverse stigmatization and psychological outcomes in the form of hysteria, stress, anxiety, feeling of incompatibility, depression, increased substance-dependence, and post-traumatic stress disorder (PTSD) [77]. Patients have previously reported that fast infection transmission and illness led to discrimination, with the causative agent being portrayal by media. Patients often felt isolated, abandoned and ostracized by the community and were refused healthcare services, due to discrimination and stigma. During isolation, the feeling of abandonment is often evoked and lasts beyond the hospital discharge [39,54]. This is of great concern to vulnerable populations such as immigrants and slum dwellers when they are discharged from hospital and begin quarantine at home, as they become concerned about how the community would react to them, and thus placing them under extended isolation [53].

Stigmatization often can lead to substantially greater cases of people infected with the virus, resulting in those at risk of being infected avoiding healthcare services, and therefore creating a challenge to control infections by public health authorities [61,62]. The familiarity of knowing a family member or a friend that has tested positive for COVID-19 is a well-entrenched factor that impacts stigma positively [41]. At a community level, medical care is often sought very late, and often the medical history is hidden, especially that relating to travel. Another very important aspect of stigmatization is societal rejection in the form of discrimination, suspicion and avoidance by neighbourhood, insecurity regarding properties, workplace prejudice, withdrawal from social events even after containment of epidemics, and even health crimes [12,102,26,71]. This may be influenced and compounded by misinformation and therefore all community strata must collaborate to counteract social stigma [53].

Siu [70] and Person et al. [57] reveal that stigmatization amongst the sufferers from the 2003 SARS outbreak was remarkably evident several years after they contracted the disease. Even after three years of SARS outbreak in 2003, Wu et al. [98] indicate that a significant number of the related hospital workers in Beijing, China experienced some PTSD. It is against this background that Turabian [75] posits that after the COVID-19 pandemic, general health practitioners and the entire public should expect a new wave of stigmatization and mental health problems.

The WHO 2020.5 guidelines recommend that discrimination and stigma against affected or discharged COVID-19 patients should be prevented and eliminated. Mitigating such challenges and protecting the health, safety and well-being of persons infected with COVID-19, in accordance with the guidelines, requires well-coordinated and comprehensive measures for infection prevention and control, clinical health and safety management, and mental health and psychosocial support. In this regard, some countries have introduced specific legislation, for example by criminalizing such acts and providing regulatory protection for COVID-19 patients and healthcare providers, to prevent and eliminate stigma, violence and harassment [38,81]. National governments, local authorities, and communities can adopt community-engagement and communication initiatives and behavioural standards, to prevent psychological impacts and stigmatization of affected or recovered patients at the workplace and in the community [76].

Discussion

A pandemic can be controlled where strong governance and functional policy within the healthcare system exists through government adoption of public health inferences. In many countries despite the initial rapid cases, mass population quarantine, tight lockdowns, heightened testing facilities, stimulus packages from government, efficient policy-driven interventions led to COVID-19 viral transmission prevention [4,101]. Global experiences indicate that early diagnosis, prompt testing and detection, as well as thorough patient management are pivotal in the management of the COVID-19 pandemic [9]. Unfortunately, in Africa where fragile healthcare systems exist, infections and mortality due to COVID-19 will be on the increase.

A comprehensive approach to the effective management of COVID-19 patients requires a wholesome approach from all stakeholders. For the WHO guidelines to be effective in Africa, there are needs to upgrade facilities, train, equip and enhance the capacities of the frontline health workers to provide adequate care for people diagnosed of COVID-19 irrespective of the level of severity. Adequate financing is essential for an adequate and effective risk assessment, contact tracing, clinical management of COVID-19 cases in Africa. It is not just sufficient to prioritize prevention and management of COVID-19 pandemic in Africa; such prioritization must be backed up with sufficient financing. The legislation and government personnel including politicians and other functionaries must work hand in hand in the appropriation of health expenditures. The expenditures start from community mobilization on prevention strategies, community support and relief packages, and campaign against the stigmatization of infected people. The need for adequate financing and strengthening of Africa countries' surveillance system for effective COVID-19 contact tracing cannot be overemphasized. Provisions of well-equipped hospitals, personal protection equipment and payment of allowances for the frontline health workers remains the cornerstone for COVID-19 financing and must be accorded full attention.

While the risk of quick COVID-19 spread in various settings is likely, the populations affected do not necessarily have the same exposure and transmission risks. It is imperative that during the pandemic, site-specific risk assessment is undertaken in settings so that human socio-economic well-being and health risks can be determined. Although the WHO risk assessment interim guidance exists for healthcare workers exposure, mass gatherings that include generic, sporting and religious events, there needs to be African context specific guidance that also focuses on individuals and populations. Like the healthcare worker exposure interim guidance that focuses on various aspects of exposure, a guidance that is context specific needs to be available for African countries inclusive of policy political, environmental, socio-economic, ethical and scientific factors. The Public Health Surveillance for COVID-19 interim guidance makes mention of surveillance at community, primary care, hospital based, and closed setting levels. So too, should risk assessment guidance follow to ensure that individuals and populations are assigned to risk levels correctly to ensure correct COVID-19 management and care [89]. There should also be support for community-driven risk assessment that assists in local knowledge building and local ownership of the data into assessments and databases led by the government are ensured. With risk assessment comes risk communication and so to better understand the preferred communication channels, perceptions, power-dynamics, concerns and belief systems rapid behaviour assessment is required. Emerging or existing protection risks for marginalized or vulnerable groups such as gender-based violence, risk of family separation due to quarantine, isolation or hospitalization, child labour, must be considered not only as a consequence of COVID-19 but also of social and/or public health measures. In risk communication, there needs to be preferred communication channels and languages as a key component of the response. Local network and community influencers are essential to delivering risk-related, behaviour-focused and empowering messages, rather than those of fear and suspicion, based on people's right to access healthcare services so that as messages instructing people to remain safely at home to prevent transmission is not seen as avoiding health facilities if required [37].

In the context of limited COVID-19 cases and where widespread transmission is occurring, evidence indicates the importance of contact tracing for the containment of the virus. Countries in Asia were able to contain the initial virus outbreak due to widespread testing, contact tracing and the quarantine of people, and these efforts are vital in the progressive attempts to contain the virus [90,60]. Through contact tracing new case identification, often before the onset of symptoms and the symptom -onset to isolation time being reduced substantially, thereby decreasing the probability of sustained transmission [16]. In the tracking and tracing of COVID-19 cases, a combination approach is required, as was seen in China, Vietnam, and New Zealand, whereby network searches and mobile data utilization led to the effective and prompt identification of people at risk of infection, and the utilization of artificial intelligence to improve contact tracing and manage potentially infected persons [66,52,7]. Within the hospital setting, effective nosocomial control can be achieved through contact tracing accompanied by both testing and quarantine [27]. Resources for contact tracing must be adapted to the local context of individual countries. In countries where the cases are low, contact tracing can be conducted by using the existing local public health structures. Even then, contact tracing is resource-dependant and intensive, especially where physical distancing cannot be accommodated and the contacts for individual cases are high. In countries with escalating cases, contact tracing may be challenging. As contact tracing and contact follow-up may be difficult to sustain in areas with large case numbers, it may be necessary to limit the interaction vigour. Thus, the use of technology becomes important to assist and scale-up efforts for contact tracing.

In clinical management, the evidence thus far supports home recovery, which includes self-isolation for COVID-19 patients who have mild COVID-19 [13]. Patients presenting with moderate or severe disease are however monitored in a COVID-19 Care Centre. Symptomatic patients will tend to exhibit symptoms within approximately 11 days after infection [43]. Per the WHO revised discharge protocol [82], asymptomatic patients should be de-isolated 10 days after the initial positive test, while symptomatic patients should be de-isolated 10 days after symptom onset, plus at least 3 days without symptoms, without repeating Polymerase chain reaction (PCR) test. Various countries have adapted and modified this policy to suit country conditions.

After confirmation of COVID-19 diagnosis, the approach of clinical management depends on the severity of the case. Self-isolation and supportive care are the mainstays for both mild and moderate cases with proper advice for patients to watch for symptoms of the development of severe disease [22]. Hospital isolation is still recommended for patients with comorbidities and other risk factors for the development of severe disease. Severe COVID-19 cases require supplemental oxygen therapy. Critical patients who developed ARDS often need mechanical ventilation [69]. ECMO is an alternative approach proposed for the management of critical cases instead of mechanical ventilation [19], as it keeps the patient viable and the blood oxygenated without further pressure exhaustion of the weary lungs. Thus, it shows better outcomes due to a lower incidence of lung injury with subsequently reduced mortality rates compared to mechanical ventilation. However, there are several barriers in front of the broad implementation of this technique on a wider cohort of patients. It requires special facilities and highly trained teams. Dexamethasone use in severe cases is still controversial. While the WHO and the US-CDC do not support dexamethasone use in COVID-19 severe cases, NHS changed its COVID-19 guidelines to include dexamethasone to reverse the lethal cytokine release syndrome. Doctors in Africa should exert great caution before adding dexamethasone to the regional guidelines. Special care should be offered to the higher incidence of nosocomial infections in Africa that might expose the patients to lethal complications with the use of corticosteroids. Another perspective is about strategies to prevent the development of the lethal cytokine release syndrome mediated by COVID-19 in a certain subset of patients. There are several classes of pharmacologic agents that are considered good candidates for this aspect. Those include the antihistamines and anti-leukotriene agents which are used for the prevention and management of bronchial asthma with high safety profile. So far, numerous agents have been proposed as treatments for COVID-19. However, with

insufficient data and the use of these medications outside of well-conducted randomized trials, recommendations are being made with caution.

While it is important to focus on COVID-19 patients before and during hospitalization, necessary caution needs to be taken post-discharge and during the recovery phase to manage mental health, and prevent suicide [25,33]. Due to the stress and fear related to COVID-19, infection symptoms, living in sudden and extreme poverty, loss of jobs, hunger and food insecurity, economic crises and inability to cope with social stigmas, several suicide cases have been reported globally. To help alleviate these traumatic situations, governments need to engage in effective community counselling [67]. It is imperative that mental health care adequately reaches all infected people, those under quarantine, family members and/or caregivers, healthcare personnel and the public. Patients in hospitals should receive psychological support during treatment so that their response to treatment and mental health status is improved [78]. Beyond the hospital, long-term COVID-19 outcomes are unknown, symptoms can last in patients over days, weeks or months, and there is still much more required to gain a full understanding of the viral transmission, immunity and durability, with the prospect of reinfection [63]. Psychological support and intervention after hospital discharge must not follow a “one size fits all” approach but rather individualized based on prior disease severity experienced and prior mental health background [56]. While the WHO Clinical Management of COVID-19 interim guideline addresses some of the strategies required for patients in hospitals and after discharge, it needs to include more detail in the context of recovering patients re-entry back into society and potential stigmatization [47]. Thus, healthcare personnel in hospitals must administer a needs-based, stepped approach that consists of psychological care and information provision, with prompt after hospital discharge follow up. This creates a full complement of an organized rehabilitation package and appropriate psychological service referral where required [72].

In conclusion, the discussions raised in this review highlight the significance of prudent filtration and regional modelling of the global care guidelines to respond properly to the health and social threats posed by COVID-19 on the regional level without exposing our population to further unnecessary morbidities and casualties. While the current WHO guidelines on COVID-19 management could be cost-saving especially in Africa, where resources are limited and health manpower is in shortage, there are needs to establish the peculiarity of Africa viz-a-viz the virulence of the virus. The knowledge of the virulence may help determine the timing of discharge for asymptomatic patients. Nonetheless, the WHO guidelines on contract tracing, psychological management of COVID-19 survivors and eradication of stigmatization and adequate PPE for frontline COVID-19 health workers are sufficient in the African context. To maximize the impact of the WHO guidelines in Africa, there must be context-specific guidelines, increased funding, strong political will along with adequate protection of frontline health workers.

Limitations

Writing a review on COVID-19 is challenging equal to chasing a rapidly moving target. New information is made available on daily basis. Authors made every effort to provide a comprehensive evaluation of the published evidence and to accommodate the rapid turnover of information related to the COVID-19 pandemic by also including preprints. No quantitative data extraction was carried out, what we have done is a review/evaluation of the literature that has several advantages such as the ability to allow us to identify parameters and gaps in a body of literature, answer broad research questions as well as conduct qualitative synthesis [103].

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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